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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

10/537613

Applicant's or agent's file reference 2022381PC/ko	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI 2003/000957	International filing date (day/month/year) 15.12.2003	Priority date (day/month/year) 18.12.2002
International Patent Classification (IPC) or national classification and IPC D21F 7/08		
Applicant Tamfelt OYJ ABP et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 28.06.2004	Date of completion of this report 25.02.2005
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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI 2003/000957

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 10 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 11 - 14 received by this Authority on 17.12.2004
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 5 as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI 2003/000957

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1 - 15</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1 - 15</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1 - 15</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The invention relates to a method of manufacturing a press felt, in which method the joining edge areas of the base fabric are pressed against each other during the attachment by a predetermined force so that the thickness of the overlapping joining edge areas substantially corresponds to the thickness of the rest of the base fabric.

The most relevant documents cited in the International Search Report are:

D1: US 5464488 A
D2: WO 02053833 A1
D3: US 4090897 A

Document D1 discloses a method for welding together the overlapped ends of a length of a plastic fabric to form an endless belt. The bond is accomplished by softening of the yarns by the application of ultrasonic energy. The layers are compressed together between the horn, which delivers the ultrasonic energy, and an anvil, in order to force the yarns to adhere to one another. The length of time that ultrasonic energy is delivered to the two overlapped fabric layers, and the pressure placed upon those layers during that time, are controlled in order to ensure that no melting of the yarns occurs. Thus, the joining edge areas of the fabric are pressed against each other during the attachment by a predetermined force.

D2 relates to a method of manufacturing a press felt. The method described in D2 comprises the steps of forming a first

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

base fabric module woven into a closed loop and arranging a second base fabric module on top of the first base fabric module, which second base fabric module is woven in a horseshoe form and interconnected with a seam.

D3 discloses a method and apparatus for seaming thermoplastic mesh fabrics by means of an ultrasonic welding tool. The method comprises the steps of juxtapositioning, in an overlapping relation, free edge portions of the fabric and selectively compressing said superimposed filaments between a metallic anvil and the tip of an ultrasonic welding tool.

Document D1 is considered to represent the closest prior art.

The amended claim 1 differs from D1 in that it refers to the manufacturing of a press felt, in that the predetermined force is applied in order to make sure that the thickness of the overlapping joining edge areas substantially corresponds to the thickness of the rest of the first component and in that the permeability in the overlapping joining edge is arranged so that it substantially corresponds to that in the rest of the base fabric.

There is no indication in D1 that would lead a person skilled in the art to adjust the pressure between the horn and the anvil, so that the thickness of the overlapping area corresponds to the rest of the fabric. In D1, pressing force is limited, since care is taken not to cause any damage to the yarns. Even if the horn was pressed with a greater pressing force, the reduced thickness would only apply at the limited seam area or at the weld spot. The rest of the overlapping would still have the thickness of two overlapping fabric ends.

Furthermore, D1 does not teach or motivate a person skilled in the art to arrange the permeability in the attachment area, so that it substantially corresponds to the rest of the fabric.

Consequently, the method according to amended claim 1 is considered to involve an inventive step in view of D1. Similarly, the press felt according to claim 9 and the base fabric for a press felt according to claim 14 are considered to involve inventive steps.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

Neither does either of the documents D2 or D3 give any indication that would lead a person skilled in the art to the claimed method of forming a press felt, the claimed press felt or to the claimed base fabric.

Thus, the invention according to claims 1 - 15 is novel and considered to involve an inventive step. The invention fulfils the requirement of industrial applicability.

CLAIMS

1. A method of manufacturing a press felt, the method comprising at least the following steps of:

forming a base fabric (2), whose at least one layer comprises at least a first planar component (4), which is formed from a plurality of longitudinal yarns (6) that travel in the machine direction (MD) and from transverse yarns (7) that travel in the cross machine direction (CMD), and the first component (4) is provided with a first transverse (CMD) joining edge area (11) and a second transverse joining edge area (12);

arranging the first transverse (CMD) joining edge area (11) and the second transverse joining edge area (12) of the first component (4) to overlap each other and forming a base fabric (2) with the shape of a closed loop; and

attaching at least one batt fibre layer (1, 3) to the base fabric with the shape of a closed loop, and the method comprising

attaching the joining edge areas (11, 12) undetachably to each other before the attachment of the batt fibre layer (1, 3), **characterized** by

pressing the joining edge areas (11, 12) of the first component (4) against each other during the attachment by a predetermined force (F) so that the thickness (G) of the overlapping joining edge areas (11, 12) substantially corresponds to the thickness of the rest of the first component (4).

2. A method according to claim 1, **characterized** by forming at least one thinned joining edge area (11, 12), where the density of transverse yarns is smaller than in the other portions of the first component (4).

3. A method according to claim 2, **characterized** by removing transverse yarns (7) from at least one joining edge area (11, 12) of the first component (4) from a predetermined portion (L).

4. A method according to claim 2, **characterized** by providing, when the first component (4) is formed, at least one joining edge area (11, 12) of the component with a smaller density of transverse yarns than the rest of the first component (4).

5. A method according to any one of preceding claims 2 to 4, **characterized** by forming a thinned first joining edge area (11) and a second joining edge area (12) in the first component (4).

6. A method according to any one of the preceding claims, **characterized** by attaching the overlapping joining edge areas (11, 12) to each other by welding.

7. A method according to any one of the preceding claims, **characterized** by providing at least the portion of the overlapping joining edge areas (11, 12) with an attachment area (15), where the joining edge areas (11, 12) are attached to each other undetachably, and making the boundary surface (16) between the attachment area (15) and the rest of the first component (4) non-linear.

8. A method according to any one of the preceding claims, **characterized** by
providing at least the portion of the overlapping joining edge areas (11, 12) with an attachment area (15), where the joining edge areas (11, 12) are attached to each other undetachably, and
providing the attachment area (15) with several attachment points (17, 18), which form a pattern that imitates the pattern of the base fabric surface.

9. A method according to any one of the preceding claims, **characterized** by
forming at least a first planar component (4),
forming at least a second component (5) with the shape of a closed loop,
arranging the first component (4) on top of the second component (5), and
connecting the joining edge areas (11, 12) of the first component (4) with an overlapping joint.

10. A press felt for a paper machine press section, the press felt comprising:

a base fabric (2), which comprises a plurality of longitudinal yarns (6, 8) that travel in the machine direction (MD) and a plurality of transverse yarns (7, 9) that travel in the cross machine direction (CMD) and whose at least one layer comprises at least a first planar component (4), which includes a first transverse (CMD) joining edge area (11) and a second transverse joining edge area (12) and where the joining edge areas (11, 12) have been connected to each other; and

at least one batt fibre layer (1, 3),

and where the first joining edge area (11) and the second joining edge area (12) of the first component (4) have been arranged to overlap each other,

and where the joining edge areas (11, 12) have been attached to each other undetachably before the attachment of the batt fibre layer (1, 3), **characterized** in that

the joining edge areas (11, 12) of the first component (4) have been pressed against each other, and

the thickness (G) of the overlapping joining edge areas (11, 12) substantially corresponds to the thickness of the rest of the first component (4).

11. A press felt according to claim 10, **characterized** in that the density of transverse yarns is smaller at least in one joining edge area (11, 12) of the first component (4) than in the rest of the first component (4).

12. A press felt according to claim 11, **characterized** in that transverse yarns (7) have been removed from at least one joining edge area (11, 12) of the first component (4) from a predetermined portion (L).

13. A press felt according to claim 11, **characterized** in that at least one joining edge area (11, 12) of the first component (4) is provided with a smaller density of transverse yarns than the rest of the first component (4) during the manufacture.

14. A press felt according to any one of preceding claims 10 to 13, **characterized** in that the joining edge areas (11, 12) of the first component (4) have been attached to each other by welding.

15. A press felt according to any one of claims 10 to 14, **characterized** in that the width of the overlapping area of the joining edge areas (11, 12) of the first component is 5 to 20 mm in the machine direction (MD).

16. A base fabric for a press felt, comprising:

a plurality of longitudinal yarns (6, 8) that travel in the machine direction (MD);

a plurality of transverse yarns (7, 9) that travel in the cross machine direction (CMD);

at least a first planar component (4) in at least one layer of the base fabric (2), and the first component comprises at least a first transverse (CMD) joining edge area (11) and a second transverse joining edge area (12), and where the joining edge areas (11, 12) have been connected to each other, and where

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the first joining edge area (11) and the second joining edge area (12) of the first component have been arranged to overlap each other; and

the joining edge areas (11, 12) have been attached to each other undetachably, **characterized** in that

the joining edge areas (11, 12) of the first component (4) have been pressed against each other, and

the thickness (G) of the overlapping joining edge areas (11, 12) substantially corresponds to the thickness of the rest of the first component (4).

17. A base fabric according to claim 16, **characterized** in that at least one joining edge area (11, 12) of the first component (4) has a smaller density of transverse yarns than the rest of the first component (4).

18. A base fabric according to claim 16 or 17, **characterized** in that the joining edge areas (11, 12) of the first component (4) are attached to each other by welding.